

The Confluence

Newsletter of the Rogue River Watershed Council

Streams Move, Streams Change: An Introduction to the Concept of Response Reaches

By Charles Lane, PhD

An important concept in fluvial geomorphology is that of source/transfer/response reaches (sections) of a river (Figure 1). Typically, they are found upstream-to-downstream with response reaches located at the bottom of the basin. However, in the unusual world of the Western Cascades, stranger things do happen.

Definitions:

Source reaches are typically first order streams where non-alluvial (colluvial) sediments enter the system (e.g., landslide failures), and are transported during rare, large flow events.

Transfer reaches are typically able to carry small increases in sediment loads and change little in response to small reduction in sediment supply. Generally, the sediment removed balances the sediment supplied.

Response reaches are ones in which geomorphic adjustment occurs in response to changes in sediment supply. Zones of transition from transfer to response are therefore locations where channel instability can exist.

To understand channel instability in these transition zones we must look at the relationship between stream capacity and sediment load. Capacity is the amount of sediment that the river has the energy to transport. Controls on capacity are velocity and depth of water, channel slope and shape, discharge, and channel roughness. Change these controls and you change the capacity for sediment transport. Load is the total amount of sediment transported. If capacity exceeds load, erosion occurs. If load exceeds capacity, deposition occurs. If the two are balanced, a state of dynamic equilibrium is present (this is typically true in transfer reaches).

Figure 2 (see page 3) is a map of the milepost 3-5 section of South Fork Little Butte Creek showing an unusual *intermediate* response reach (geologically controlled). The gradient decreases from >75 feet per mile upstream to approximately 40 feet per mile in the response reach. The

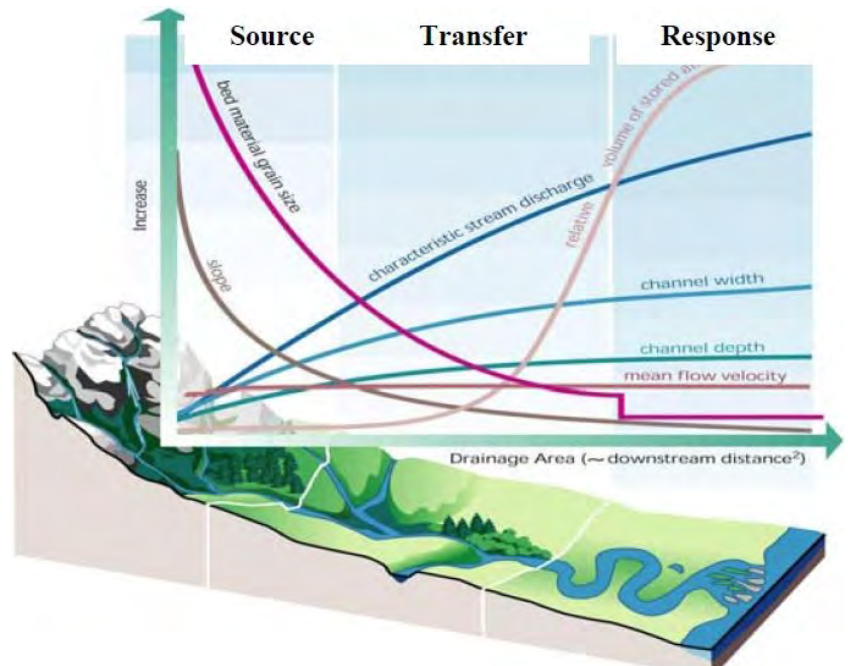


Figure 1: Watershed sediment source, transport and response locations. The response reach is typically at the bottom of the basin (e.g., lake, ocean, or confluence with another stream). In the Western Cascades of Oregon it is unusual, but not uncommon, to find intermediate response reaches on mountain streams. Illustration: Federal Interagency Stream Restoration Working Group

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RRWC's mission: Stewardship of the Rogue River watershed through restoration, education, and community involvement.

RRWC is tax-exempt under section 501(c)(3) of the Internal Revenue Code and a recognized watershed council. Watershed councils were authorized by the Oregon Legislature in 1995 to promote and implement voluntary cooperative conservation actions.

Notes from the Executive Director's Desk

I have come to realize that there is no "stable." People, other critters, partnerships, and organizations are either growing or decaying. There is little question that Rogue River Watershed Council is in a period of growth!

We recently added a new staff person to our growing ranks. And after just a few weeks, everyone here at RRWC, as well as our partners, are sure happy Alexis Brickner filled that spot. (You can read more about Alexis on page 4.) She is really going to help us get fish passage work queued up and implemented.

Our programs are continually coming into clearer focus (another welcome change). We are implementing streamside forest restoration projects along Gilbert, Sugarpine, and Wagner Creeks right now. These under-construction projects will allow Donna to make connections with other streamside landowners. Then Sarah and Alexis will turn those connections into fish passage, instream flow, streamside forest, or instream habitat restoration projects. Of course, aside from landowner outreach, Donna is also working to identify the most beneficial events for RRWC to participate in for engaging landowners, prospective volunteers, Friends, and donors.

As with anything that is growing, support is needed. For us, the support of a growing donor and Friend pool is needed. And this is a place where you can help. You are receiving this newsletter because you became a Friend, made a donation, or contributed as a volunteer. Thank you – we surely appreciate your help! Now, if you can go one step further and invite a neighbor or friend to volunteer with a fish fling or a clean-up...or if you feel strongly that RRWC is helping to make the Rogue River and the creeks that flow into it healthier, encourage your friends to make a donation or become our "Friend." These efforts will go a long way in helping us make the Rogue healthier for us all.

...and from the Board Chair

Why does the word CHANGE cause so much angst and fear in many of us? Change so often assumes a negative connotation. We should embrace and think of the positive things that can come from change.

The Rogue River Watershed Council came into existence as the result of change. Two years ago, four watershed councils went through a lengthy process of merging into one watershed council. There was fear and angst during the process, but the vision, hope, and dreams of creating a more efficient, effective, and stronger organization prevailed, thanks to the hard work of strong leaders and many volunteers.

Now, the Rogue River Watershed Council is doing just that – creating change. We are working to cause positive change in our habitat, streams, watershed, community, and our economy. For more detail on what we are doing or have accomplished over the last couple of years, please visit our website at www.rogue riverwrc.org and "like us" on our Facebook page as well.

We need your help in creating more positive change. Please consider joining us as a Friend, volunteer, donor, or board member. We would so love to have you as a member of our team.



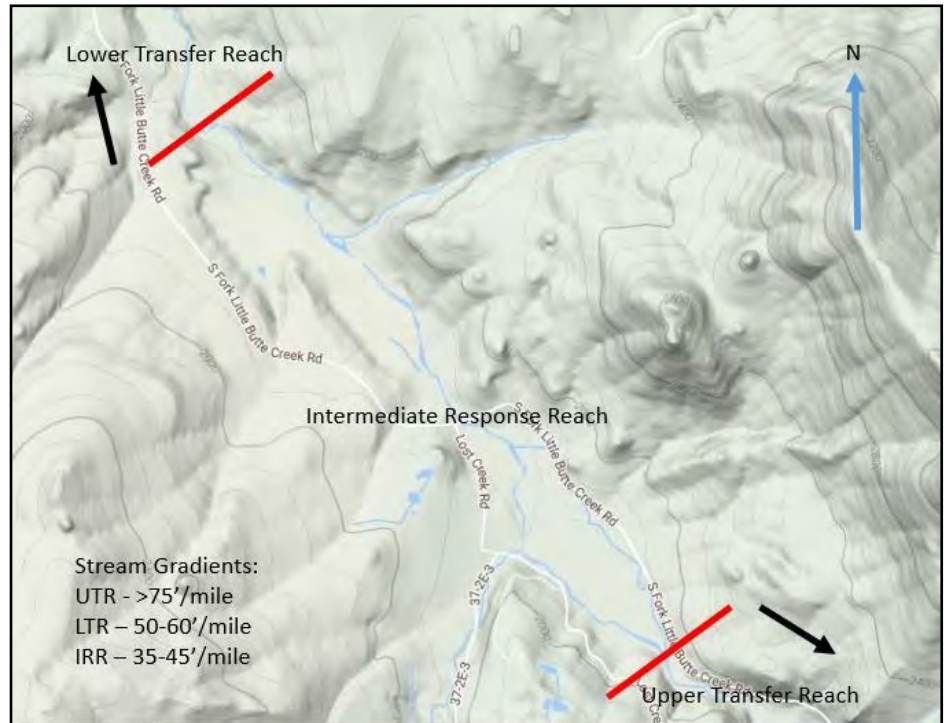
Photo by Justin Clifton

*Streams Move, Streams Change
(Continued from page 1)*

change in gradient is accompanied by a change in channel shape (wider) and water depth (shallower), and a decreased stream velocity. These create reduced stream capacity to handle the sediment load. The stream *aggrades*, or increases the elevation of its channel (deposition).

As a result, this reach of South Fork Little Butte Creek has demonstrated an ability to rapidly shift between single- and multiple-channel (braided) morphologies and accomplish old channel reactivation (often on the opposite side of the flood plain) at different flood stages. In other words, it is a river reach of continuing channel instability. For those of us engaged in stream restoration activities it is important to identify and understand this type of river reach as it behaves quite differently than the more stable transfer reaches.

Figure 2: South Fork Little Butte Creek (SFLB) from approximately SFLB Road mile 3-5, centered on the river bridge at Milepost 4. The much-higher gradient upstream transfer reach is to the lower right. The somewhat-higher gradient downstream transfer reach is to the upper left. The upper half of the intermediate response reach (in particular) is a dynamic (and unstable) transition from the upper transfer reach.



Charles Lane is Professor of Geology, Southern Oregon University. Starting with the aftermath of the January 1997 New Year’s Day Flood, he has been studying the hydrologic and morphologic behavior of South Fork Little Butte Creek.

PROJECT PROFILE

Once Upon a Time...

Many, many years ago, along a small stream in Grants Pass... So begins the story of the Gilbert Creek restoration project. Yes, it really did start out years ago when the Middle Rogue Watershed Council (one of our precursor organizations) cleared out blackberries and planted dozens of incense cedar and ponderosa pine trees along the west bank of a stretch of Gilbert Creek lying between Gilbert Creek Park and two schools in northwest Grants Pass. But, like many tales, it didn’t look as though this one was going to have a happy ending. With no maintenance, the blackberries came back in full force, with many of the trees stunted due to the resulting competition for moisture and light.



Enter Rogue River Watershed Council, Oregon Department of Fish and Wildlife’s Salmon and Trout Enhancement Program (STEP), and Grants Pass School District #7. Last summer these three entities decided to combine forces to combat the blackberries and plant an additional 400-plus trees and shrubs to provide more shade for the creek, decrease erosion, and create a more welcoming, safe, and accessible location for outdoor learning.

Now, thanks to funding from the Oregon Watershed Enhancement Board Small Grant Program; assistance and donations from the City of Grants Pass, Mycorrhizal

Applications, and Starbucks Coffee; and hours of dedicated volunteer labor from individuals representing RRWC, Middle Rogue Steelheaders, Southern Oregon FlyFishers, Grants Pass High School, Humble Heron Fly Fishing, and Strauss Ecological Services, there’s going to be a “happily ever after” to this tale.

Changes at RRWC

In all communities, people come and people go. Rogue River Watershed Council is no different. In this issue we welcome a new staff member, say goodbye to two valued board members, and announce a change in our board officers.

Welcome Alexis Brickner, Fish Passage Project Manager

“After growing up in the Connecticut woods and the Kansas River valley, I found myself in love with Oregon after an internship at an organic farm in Cottage Grove in 2006. I completed my B.S. in Environmental Studies from the University of Kansas in 2007 and began the journey west to Gunnison, CO for a riparian restoration internship. I fell in love with working outside and soon moved to Oregon to work for the Institute for Applied Ecology (IAE). I spent two seasons with IAE before starting my master’s program at Oregon State, studying rare plant conservation. From there I moved to Coos Bay to work for the Coos Watershed Association as Riparian and Invasive Species Project Manager.



I’m excited to bring my watershed experience from the coast to the Rogue Valley and I intend to take advantage of all the wonderful outdoor opportunities the region provides. I enjoy exploring, cooking, all-things-plant related, and hanging out with my two orange cats, Finley and Cheddar.”

Farewell Jenny Morgan and Dave Hussell

We say goodbye and thank you to two board members who have been with RRWC since its inception, each one having served as board member of their “predecessor” watershed councils, Bear Creek Watershed Council and Little Butte Creek Watershed Council, respectively. Jenny will continue her involvement with RRWC through her work with the Bear Creek Working Group and as a representative of one of our valued partners, Rogue Valley Sewer Services. We hope to entice Dave back as a volunteer on our many Little Butte Creek projects – if we can pry him away from the golf course for that long!

RRWC Board Chair and Secretary Positions Do a Switcheroo

Former board secretary, Bob Jones, took over leadership of the council board in January, replacing Ray Tharp, who had served in that capacity for two years. Ray, not quite being able to take a break, took on the secretary role. Thanks, Ray, for your dedicated service and leadership!

Change Your Bottles and Cans into Cash...for RRWC!

A person has three basic options when it comes to getting rid of returnable cans and bottles in Oregon: one can trash them (HIGHLY inadvisable!), recycle them, or return them for the deposit. The Oregon Beverage Recycling Cooperative (OBRC) has recently made the latter much easier with their new BottleDrop Redemption Centers (one in Grants Pass and another in Medford). Individuals can open a BottleDrop account and then quickly, cleanly, and safely return their cans and bottles in special green bags. But...wait...it gets better! OBRC has just initiated a new fundraising program where BottleDrop account holders can transfer money from their accounts into a featured fundraiser’s! And yes, RRWC is one of those featured fundraisers! So, get yourself a BottleDrop account, take those cans and bottles into a redemption center, and go online to transfer a part (or all!) to [RRWC’s account](#).

Google Oregon BottleDrop for more information.

Have you initiated or renewed your RRWC Friendship for 2017?

If not, ACT NOW!

Visit www.rogueriverwc.org/get-involved/membership/ to sign up.

**Henry David Thoreau once said,
“Friends...they cherish one another’s hopes. They are kind to one another’s dreams.”**

Please help us fulfill the hope and dream of restoring water quality and salmon and steelhead habitat in our watershed by becoming a friend now.

Changing Restoration Paradigms

by Jonas Parker

As trees begin to flower, it's obvious that change is in the air. Before we dive into a summer of restoration, it's a good time to look back at where we've come from.



Stream cleaning by the BLM in 1957

Our thinking of what is best for a watershed has evolved a lot since 1957, but we're at another juncture. In order to be competitive and successful, we need to embrace grander ambitions and a holistic approach.

Recent talks got me thinking: in one, NOAA Fisheries conveyed that despite millions of dollars being spent on stream restoration, Coho Salmon populations are stuck on a negative and increasingly dire trend. Other presentations were in regard to beaver and lamprey. Despite their importance to both Coho Salmon and watershed health, we know so little about beaver and lamprey that conservation goals haven't been widely adopted. I see the two issues as related.

We are being afforded an opportunity: rather than doggedly continuing with small, reactive, and opportunistic projects, we need to collectively pause so that when we move forward again, we're biting off something more. We need to bring more partners to the table so that we can better understand our watersheds. The materials and technical expertise that can be leveraged from these partnerships is invaluable. Our proposals need to further an ecological understanding of our watersheds and we need to address as many of these limiting factors as soon as possible.

As we change from winter to summer, give thought to where we've been and where we could go in the future. A holistic, multi-faceted approach to restoration will see us and our watersheds thriving well into the future.

Jonas Parker is the district hydrologist for the US Bureau of Land Management based out of Medford.

Volunteers are not paid...not because they are worthless, but because they are priceless.

RRWC could not do what we do without the countless hours of work donated by our volunteers, from the production of this newsletter to the governance of the organization. To our volunteers: thank you...we appreciate all of the time, effort, donations, and dedication you expend to make our work successful.

April 23 - 29 is National Volunteer Week; please consider how you might like to share your talent with RRWC.

OFF THE RESOURCE SHELF

The Mother of All Change: Climate Change

As you've probably figured out, the theme of this issue of *The Confluence* is "change." But none of our articles have focused on what might be considered the most important change the entire world is facing – climate change. Here are three online resources that will help you better understand this important issue.

First off, a great website for K-12 students can be found at the Environmental Protection Agency's [A Student's Guide to Global Climate Change](#). It's an interactive website that not only covers the basics of climate change, but allows students to see how climate change affects people and environments across the globe.



[Climate Literacy: The Essential Principles of Climate Science](#), a 2009 effort by some of the leading science agencies and organizations in the country, presents information that forms the basic framework for understanding climate change. This is an excellent place to start if you're interested in increasing your climate science literacy.

If you're interested in climate change in Oregon, check out the recently released [Third Oregon Climate Assessment Report](#). This report presents strengthening evidence that climate change is already affecting Oregon, and will continue to do so. The report includes chapters on climate change effects on Oregon's water resources, forest ecosystems, agriculture, and human health.



UNDER THE SURFACE

Ch, Ch, Ch, Changes!

by Jay Doino

Infants to toddlers to teens – oh, my! What changes! Especially the teens and their pubescence. But I'll take salmon any day. Sure, they change too, but it's way cooler than in humans. Salmon smolt! Yup – smolt. No joke. Smoltification is the series of physiological changes where juvenile salmonid fishes adapt from living in fresh water to living in the ocean. These include changes to the fishes' color, shape, their osmoregulatory system (the system for maintaining internal salt and water concentrations), and more. And because fish biologists lack imagination, we call fishes of this life stage "smolts." Smoltification typically occurs in late winter and spring before (and during) the downstream migration to sea. And it's not just salmon that smolt. Steelhead do too.



From *Field Guide to the Pacific Salmon*,
by Adopt-a-Stream

Smoltification is a taxing process, but living in the ocean has advantages – and disadvantages, like predators. Big, scary ones too. Being a smolt is like being a freshman the first day of high school – easy prey. But, unlike high school, the ocean is full of really nutritious food. And not unlike a teenaged freshman, smolts are ravenous. They need to be. The



Steelhead Smolt
Photo by Jay Doino

more they eat, the faster they grow. As they grow, more prey becomes available to them and the better they become at avoiding predators. This ravenous appetite and subsequent growth is also important for a salmon's return trip upriver – aka their spawning run. Size and strength facilitate navigation of obstacles like waterfalls and dams. And finally, after their eggs are safely in the gravels to incubate during winter months, salmon die (steelhead can spawn more than once – some do, some don't), providing a slimy scrumptious package of ocean-derived nutrients to be enjoyed by all. Why not? Beats cafeteria food.

Jay Doino is a biologist with Oregon Department of Fish and Wildlife (ODFW) and has been working in fisheries in the Rogue Basin since 1999.

SPECIES SPOTLIGHT

How to Beat the Hard Times and Your Neighbors, or Metamorphosis from a Caddisfly Viewpoint

by Dave Ruiter

Editor's note: Many classes of animals undergo the process of change known as metamorphosis, though we typically associate it most often with insects. Instead of looking at one species in this issue of The Confluence, we're focusing on a larger order (Trichoptera), which those of you interested in water quality or angling may be familiar.

Caddisflies are insects consisting of about 15,000 known species worldwide. There are about 300 caddisfly species reported from Oregon alone! The group split from its sister group, the butterflies and moths (Lepidoptera), way back in the Triassic period (200 million years ago – think dinosaurs). At that time, the immature caddisflies figured out how to live in freshwater, perhaps to get away from the land critters, which mostly ate insects at that time. This newfound ability to hide in the water (along with the handy advantage of spinning silk, which they took from the Lepidoptera) allowed caddisflies to diversify to every continent except Antarctica. (Of course, it was much easier to travel at that time due to the continents being all smushed into one big piece – Pangea, which means “all the land.”)

Metamorphosis in caddisflies is the process of going from egg to larva to pupa to adult. Most all caddisfly species accomplish this process in one year. The egg stage is a waiting period. In some species, it is a short period of a couple of weeks or so and in others it may last months. As the egg is very small and doesn't require much energy, it is often the period caddisflies use to beat hard times. If the pond is frozen to the bottom, it can be a good time to be an egg. Likewise, if the stream is dry, it can be a good time to be an egg.

Once conditions are right, it's time to hit the food. The egg hatches into the larva and growth is fast – in small species, maybe only a month or so until the larva is mature. This fast generation time leads to an equally quick pupation and emergence to an adult – the so-called hatch, familiar to fly anglers – so two generations can occur in a year. Other species are slower and take a year or more to complete their life cycles.

Caddisflies occur in all Oregon aquatic habitats, even streams that are dry for eight to nine months a year. There are many new western North American species waiting to be discovered by the diligent collector.

David Ruiter has studied Trichoptera as a hobby for over 40 years. His current emphasis is on documentation of the new caddis species and caddis distribution in western North America.



Adult Ochrotrichia species

RRWC Volunteers and Staff in Action...





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Support Our Work!

Make a Donation

All donations are greatly appreciated, put to good use, and are tax-deductible. Donate online at <http://www.rogue riverwc.org/get-involved/donate/>.

Bottle Drop Redemption

Open a Bottle Drop account at an Oregon Redemption Center, drop off your cans and bottles, then transfer your donation to RRWC [online](#).

Fred Meyers Rewards

Help RRWC earn donations by shopping with your Fred Meyer Rewards Card. Link your card to us at <https://www.fredmeyer.com/topic/community-rewards-4>. Search for us by name.

AmazonSmile

Online shoppers can go to smile.amazon.com, click on your account and select RRWC as your charity of choice at no cost to you.

The map shows the Rogue River Watershed Council's service area, including Curry, Coos, and Josephine counties. It features the RRWC logo, a legend for other watershed councils, and a scale bar. Three callout boxes are overlaid on the map:

- Top Callout:** "Would you like to help us by distributing RRWC newsletters or 'friendship' brochures at your place of business? Give us a call!"
- Left Callout:** "Are you a 'Friend' of RRWC? Get a cool RRWC decal when you become one!"
- Bottom Right Callout:** "Stay connected! E-mail us to be added to our e-mail list for the latest RRWC news and announcements. And don't forget to like us on Facebook! <https://www.facebook.com/RogueRiverWatershedCouncil/>"

At the bottom left, there is a decal image with the RRWC logo and the text "Promoting stewardship of the Rogue River watershed".